

A simulation study of thermospheric disturbances in the polar cap/cusp region using a general circulation model

Hitoshi Fujiwara[1]; Yasunobu Miyoshi[2]

[1] Dept. of Geophysics, Tohoku Univ.; [2] Earth and Planetary Sci, Kyushu Univ

pat.geophys.tohoku.ac.jp

Various ionospheric disturbances resulting from the interaction between the solar wind and the magnetosphere have been observed in the dayside polar cap/cusp region. Recent studies have revealed that the ionospheric convection electric field shows significant fluctuations superimposed

on the large-scale patterns particularly in the vicinity of the cusp region. These fluctuations of the electric field are important for estimation of the Joule heating rate in the polar ionosphere/thermosphere.

The disturbances generated in the auroral oval such as the large-scale traveling ionospheric/atmospheric disturbances (TIDs/TADs) have been investigated by both observation and simulation studies. On the other hand, the disturbances generated in the polar cap/cusp region have not been studied so much as those in the auroral oval. In this study, we investigate thermospheric disturbances in the polar cap/cusp region using a general circulation model. High speed neutral wind more than 300 m/s is simulated in the polar cap region even when a low solar and low geomagnetic activity. The generation and

propagation of the disturbances are interesting issues in the polar cap region in the presence of such a wind field. We will discuss disturbances generated in various conditions in the polar cap region.